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Department of Toxic Substances Control

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June 23, 2003

Mr. Steve Lafflam
The Boeing Company
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SUBMITTAL OF WORKPLAN TO CHARACTERIZE POTENTIAL MIGRATION OF PERCHLORATE CONTAMINATION TO OFFSITE AREAS, SANTA SUSANA FIELD LABORATORY, VENTURA COUNTY, CALIFORNIA

Dear Mr. Lafflam:

The purpose of this letter is to require submittal of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Workplan (Workplan) pursuant to the November 12, 1992 Stipulated Enforcement Order (Health and Safety Code section 25187). The Workplan shall describe measures to be taken to investigate the potential migration of perchlorate contamination from the Santa Susana Field Laboratory (SSFL) to offsite areas, such as Brandeis-Bardin Institute property.

Perchlorate has been detected in Bathtub Well 1 at the Brandeis-Bardin Institute property. Bathtub Well 1, located approximately 4,700 feet north of the SSFL, consists of a pipe with flowing water at a livestock-drinking trough. The pipe is fed by a flowing artesian well adjacent to the trough. On May 28, 2003, the Department of Toxic Substances Control (DTSC) was first made aware of the presence of perchlorate at Bathtub Well 1, at a concentration of 82 micrograms per liter (µg/L), in a water sample collected by Ventura County on February 21, 2003. On May 30, 2003, DTSC staff collected two samples from Bathtub Well 1 (one duplicate for Quality Assurance/Quality Control). Laboratory analyses of the samples reported 140 and 150 µg/L. Prior to the sampling events in February by Ventura County and in May by DTSC, a sample collected from the same well by DTSC staff on March 20, 2002 did not contain detectable concentrations of perchlorate

(less than 3 ug/L). DTSC collected additional samples from four wells on the Brandeis-Bardin property on June 11, 2003; the results for Bathtub Well 1 show perchlorate at 39 and 36 µg/L. Results from the other three wells (Bathtub Well 2, OS-1, and OS-2) sampled June 11, 2003, were less than 3 ug/L.

Previous Perchlorate Investigations - Simi Valley

Perchlorate was detected in the shallow groundwater at Simi Valley in 1999. At that time, DTSC initiated an extensive effort to collect and analyze a large volume of offsite samples to determine if the perchlorate detections in Simi Valley were associated with the known perchlorate impacts at the site. The actions taken by DTSC included: collecting spring/seep samples from known locations around the site; collecting split groundwater samples from SSFL onsite and offsite wells; coordinating with the Regional Water Quality Control Board – Los Angeles Region (RWQCB-LAR) in collecting and analyzing groundwater samples from existing gasoline service station wells in Simi Valley for perchlorate; collecting soil samples from the surface water drainages; and collecting surface water runoff samples. To date, DTSC and RWQCB-LAR have collected over 210 samples as part of this effort. Based on this extensive offsite sampling effort along with the additional historical onsite perchlorate data, DTSC could not clearly establish a link between the onsite releases and the perchlorate detections in Simi Valley. It should be noted, the "hits" of perchlorate in Simi Valley are located approximately 3 to 5 miles from the northernmost SSFL facility boundary.

Additional Perchlorate Investigations –Onsite/Offsite

The recent confirmed detection of perchlorate in Bathtub Well 1 suggests that the perchlorate contamination from SSFL may have migrated offsite to the Brandeis-Bardin property based on the following rationale:

1. Perchlorate has been detected onsite at SSFL with the highest reported concentration found in groundwater at Happy Valley Area at a concentration of 1,600 ug/L. Happy Valley is located approximately two miles from the Bathtub Well 1 location.

2. Bathtub Well 1 is within 1 mile geologically down-dip and topographically down slope of the facility.

3. The area between SSFL and Bathtub Well 1 is relatively pristine land with minimal anthropogenic impacts; therefore, the presence of other or contributing sources of perchlorate, beyond those identified at SSFL is unlikely.

4. The well feeding Bathtub Well 1 is under artesian conditions. The recharge zone for groundwater at this well would therefore be located further up-slope closer to SSFL.

A connection between the perchlorate releases at SSFL and the detections in Simi Valley still remains indeterminate, even with the new data. However, based on the perchlorate detections at Bathtub Well 1 and the rationale provided above, DTSC hereby requires The Boeing Company (Boeing) to submit the Workplan to investigate the potential of offsite migration of perchlorate contamination from the facility. The Workplan should also address additional onsite investigation of groundwater and must address all potential surface water and groundwater pathways originating from SSFL.

At a minimum, the scope of work should include:

- Additional DTSC-approved groundwater monitoring wells positioned and constructed in a manner to best intercept potential perchlorate or other contaminant migration pathway(s). Since contaminant migration may have occurred at the site via both surface and groundwater pathways (or a combination of both). The additional investigation should not be based on the premise that contaminant migration would be prevented by geologic features such as faults and finer-grained stratigraphic units. However, the effects of faults and finer-grained units, specifically the Shear Zone and North Fault, should be evaluated through the installation of additional groundwater monitoring wells, aquifer testing, and the evaluation of water quality data to assess the nature of any effects on contaminant migration. Due to the complexities and inherent uncertainties associated with the groundwater flow at the site, several groundwater monitoring wells may be required. Wells may need to be installed in an iterative process. Data from the existing groundwater monitoring wells should be assessed in the areas between the known sources and Bathtub Well 1 to determine their value in characterizing the movement of contaminants. These wells may be altered or retrofitted as appropriate to provide more useful information. Multiple depth wells will be necessary to assess the effects of vertical gradients on the migration of perchlorate.

- Characterization of the hydrogeologic conditions present between known source areas at SSFL to the area of Bathtub well 1. In addition to installing new wells and retrofitting existing wells as discussed above, activities should include detailed geologic mapping, aerial photograph review, and the review of all existing hydrology data.

- Assessment of available remediation technologies, to be used as Interim Measures, to reduce and/or contain perchlorate contamination with the objective of controlling further migration of perchlorate from identified source areas. Enhancement of the existing groundwater treatment system should also be evaluated.

- Quarterly sampling of all offsite groundwater monitoring wells, seeps, and springs currently in the Boeing groundwater monitoring program for perchlorate and general chemistry parameters. Characterization of the soil and groundwater conditions in the surface drainage beginning at SSFL and leading to Bathtub Well 1 must be included. Characterization activities must include, but not be limited to, collecting soil samples in the natural drainages leading to the area of Bathtub Well 1, at a minimum of 1,000-feet intervals, at the surface and at the alluvium/colluvium and bedrock interface. If encountered, water samples must be collected from the soil borings. All samples shall be analyzed for perchlorate.

The Workplan shall be submitted to DTSC by August 18, 2003 for review, comment and subsequent approval. Upon completion of the Workplan activities, a report summarizing all soil, surface water, and/or groundwater sampling data collected during the investigation resulting from implementation of the Workplan and any prior soil and groundwater investigations shall also be submitted to DTSC. The report shall include the conclusions from this investigation, recommendations for additional investigations as necessary, and plans for actions to be taken for site remediation and/or source control as needed. These actions should be in addition to those outlined in the Happy Valley Interim Measures (HVIM) Workplan Addendum dated June 16, 2003, submitted pursuant to DTSC's May 21, 2003 letter. DTSC is currently reviewing the HVIM workplan and will be forwarding comments, which may include additional HVIM activities to those proposed by Boeing in the Workplan.

If you have any questions, please do not hesitate to contact me at (916) 255-3574.

Sincerely,

James M. Pappas

James M. Pappas, P.E., Chief
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TELECOPIER MESSAGE

DATE: 6/25/03

PLEASE DELIVER ASAP

TO: John Beach / Larry Bowerman

FROM:

SPECIAL INSTRUCTIONS:

Per your request

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